



COST

**Draft Agenda  
Management Committee Meeting**

**COST Action no. FP1202  
Strengthening conservation:  
a key issue for adaptation of marginal/peripheral populations of forest trees to  
climate change in Europe (MaP-FGR)  
Bucharest, Romania from 16 October 2015**

1. Welcome to participants
2. Adoption of agenda
3. Approval of minutes and matters arising of last meeting
4. Update from the Action Chair
  - a. Status of Action, including participating countries
  - b. Action budget status
  - c. STSM status and new applications
5. Promotion of gender balance and of Early Stage Researchers (ESR)
6. Update from the Grant Holder
7. Update from the COST Association
8. Follow-up of MoU objectives
  - a. Progress report of working groups
9. Scientific planning
  - a. Scientific strategy
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  - c. Long-term planning (including anticipated locations and dates of future activities)
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10. Requests for new members
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**1. Welcome to participants**

**2. Adoption of agenda**

*Fewer than 66 % of countries participating in the Action (19/31) are attending this meeting, therefore decisions can't be taken directly in Bucharest as the quorum for approving Minutes will not be reached. However, the instructions indicated here below can be followed:*

*Legal Number Note:[ COST 134/14; [http://www.cost.eu/action\\_management](http://www.cost.eu/action_management)]*

- The voting is by country and not MC Member (Each COST Member Country and Cooperating State participating in the Action has one vote in the MC). This means that if two MC Members from the same country have different opinions, the vote of that country is null.*
- The quorum of MC Countries is reached when 2/3 of the participating COST Countries are present at the meeting.*
- Decisions of the MC shall be taken by simple majority vote of MC Members present or represented at the meeting, with one vote per COST Member Country and Cooperating State participating in the Action. In the event of a tie, the procedure may be repeated. The MC Chair does not have the right to vote.*

*If the quorum is not reached, the present MC Members can establish a list of decisions to be taken. When this is complete, you, as Action Chair, have to start a written procedure vote (e-vote). This means sending an email to the whole MC with the list of the decisions to be taken. The MC will have at least 7 days to vote, please refer to the Vademecum (<http://www.cost.eu/Vademecum>), chap. 3.1.1, point 2 for a detailed description of the process.*

*The MC can also take decisions by means of a 'written procedure' which involves the Action Chair sending a communication, by email, detailing the need for MC approval to the entire MC or Core Group (subject to the Core Group having the formal mandate to make decisions on behalf of the MC) and must specify a date (of at least 7 days) up to which any MC Member or Core Group Member can contest their disapproval for implementing the proposed change. This 'written procedure' is commonly known as an "e-vote" and operates on the premise of presumed consent which means that if MC Members do not respond directly to the respective notifications within at set time frame (of at least 7 days), then the Action Chair and Grant Holder can assume that the MC are in agreement with the decision and can consider the resultant changes as being MC approved. If the majority of MC Members oppose the proposed changes then the intended change cannot take effect. The email used to secure MC approval by 'written procedure' must be filed with the documents that are relevant to why the MC approval was originally sought and must be uploaded onto the e-COST platform. The COST Association must be informed of the outcome of the decision. The outcome of the vote must be included in the minutes of the subsequent MC Meeting.*

### **3. Approval of minutes and matters arising of last meeting**

The Minutes of last MC meeting held in Edinburgh (UK) on 29th to 31st October 2014, that have been uploaded in the restricted area of the website of the Action (<http://map-fgr.entecra.it/>) have been approved

### **4. Update from the Action Chair**

#### **a. Status of Action, including participating countries**

Chair of the Action: Dr Fulvio DUCCI (IT)

Vice Chair of the Action: Ms Annika PERRY (UK)

Science officer of the Action: Dr Federica ORTELLI

Administrative officer of the Action: Mr Matthias KAHLENBORN

Member countries:

- 31 Cost Countries*
- 1 Intention (Montenegro)*
- 6 COST Near Neighbor Countries*
- 4 Specific Organizations*

## b. Action budget status

Due to administrative reasons the 2015 financial period started only at the end of April 2015. Costs for the II TS in Denmark and for the V Plenary Meeting are not included in the table below.

Financial Period: CGA-FP1202-3, From 2014/12/02 to 2016/02/29. YFR deadline date, Friday 29 April 2016

Instrument	Rolling workplan			
	Forecasts	Estimations	Claims	Payments
Meetings	EUR 49 620	EUR 24 420	EUR 15 232.72	EUR 1 968.68
Training Schools	EUR 44 590	EUR 27 920	EUR 22 102.98	EUR 22 102.98
Short Term Scientific Missions	EUR 34 500	EUR 20 195	EUR 15 200.00	EUR 0.00
Dissemination	EUR 5 796	EUR 0.00	EUR 0.00	EUR 0.00
Other Expenses Related To Scientific Activities	EUR 500.00	EUR 0.00	EUR 0.00	EUR 0.00
<b>TOTAL EXPENDITURE</b>	<b>EUR 135 006.08</b>	<b>EUR 72 535.00</b>	<b>EUR 52 535.70</b>	<b>EUR 24 071.66</b>

### c. STSM status and new applications

Two calls for STSMs were prepared and launched in 2015. This decision was taken by the core Group that met in Florence on June 26, 2015. During the MC Meeting held on October 16, 2015 it was requested by WGs to launch a III call in order to use funds and to increase the amount of applications.

STSM grantees in 2015

ID	Participant	Start	End	Duration
28956	Dr Eva PÅiidovÅi	2015-08-17	2015-08-30	14 days
28983	Ms Alexandra Dias	2015-09-01	2015-09-30	30 days
28972	Ms Rhea Kahale	2015-09-01	2015-09-20	20 days
29412	Mr Grzegorz Durlo	2015-09-07	2015-10-11	35 days
29531	Dr Eva Zizkova	2015-10-05	2015-11-06	34 days
29552	Dr Jelena Aleksic	2015-10-08	2015-11-06	31 days
29288	Dr Lidija Bitz	2015-11-01	2015-11-21	21 days
28938	Dr Srdjan Keren	2015-11-16	2015-12-15	30 days
28974	Ms Patricia Gonzalez Diaz	2016-01-04	2016-01-22	19 days

- **Promotion of gender balance and of Early Stage Researchers (ESR)**

Gender balance is in disequilibrium within MC (currently about 30%) in the MC. This situation is completely the opposite for STSM and TS applicants: the majority are women. The geographic balance has improved.

- **Update from the Grant Holder**

The name of CRA is changed and now is "Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria (CREA)"

Science Representative: Fulvio Ducci CREA SEL  
 Administrative Representative: Cristina Baldoni CREA SEL  
 Finance Representative: Gianfranco Fabbio CREA SEL  
 Legal Representative: Gianfranco Fabbio CREA SEL

Period	Status	Managed By	Start date	End date	YFR Deadline
<i>FP1202-20121128</i>	Ended	Dr Fulvio Ducci	2013-01-01	2013-12-31	2014-03-01
<i>FP1202-20140108</i>	Ended	Dr Fulvio Ducci	2014-01-01	2014-11-30	2015-01-29
<i>CGA-FP1202-3</i>	Active	Ms Cristina Baldoni	2014-12-02	2016-02-29	2016-04-29

Training Schools locations and dates were modified:

Start	End	City	Title	Trainers/ Trainees	Claims	Payments
2015-07-06 Postponed to January 2016	2015-07-10 Postponed to January 2016	Vilnius, changed into <b>Copenhagen DK</b>	MaP-FGR at the leading edges Changed to "Genetic analysis of fitness traits and patterns of local adaptation"	[4/14]	[0/0]	[0 / 0]
2015-08-31	2015-09-04	<b>Pieve Tesino</b>	MaP-FGR at the altitudinal margins	[5/15]	[25/25]	[25 / 25]

- **Update from the COST Association**

Respect to 2014, a reduction of the 2015 Budget was applied by Cost Office. Because of changes within the Cost system and the CRA, now namely CREA, it was only possible to start the budget utilization in May 2015.

The closure of the 2015 Budgetary year was postponed to 28 February 2016.

The 2016 Budgetary year will be closed as formerly agreed on 7 November 2016. Therefore the last Grant Period (2016) will be less than 12 months.

A new *Vademecum* has been delivered by COST in May 2016 (available online).

The review from the Action Rapporteur, Dr Nick McCarthy, was received on 9 September 2015. The Report can be downloaded in the restricted page of the web site of the Action.

The main suggestions and remarks by the Rapporteur were as follows:

- More publicity would be beneficial to the Action;
- Disseminate scientific research to a wider audience;
- Standardisation of STSM reports is necessary;
- "...there is still a huge amount of work to be carried out";
- It is unclear how much progress has been made with partially achieved objectives;
- Deliverables which have not been begun need to be addressed urgently;
- The commitment to ensuring synergy with other research programmes is in the MoU – limited success to date.

- **Follow-up of MoU objectives**

Achieved	
To analyze and raise awareness on the role of FGR in the adaptation of MaP populations	
To highlight the potential of MaP populations for the adaptation to climate change in other networks dealing with FGR conservation	
To organize conferences, workshops and training schools for the scientific community, end users and stakeholders on the role of FGR from southern edge populations for adapting forests to global change	
Partially achieved	
To collect, collate, analyze and synthesize information from past and ongoing projects related to genetic diversity and impacts of climate change	
To record and list existing conservation efforts and status, in order to identify gaps and set conservation priorities	
To perform meta-analysis of collected data to identify common trends on the dynamics of genetic diversity in relation to the response to the effects of global change	
To provide recommendations and guidelines for forest managers and national policy makers to conserve and sustainably use MaP FGR for forest adaptation and mitigation to climate change	
To publish results in journals with public access policy	
Not achieved	
To identify new research priorities on FGR for future joint EU projects	

Progress report of working groups as summarized in tables:

Achieved	
Database of forest genetic resources for conservation and for use (genetic conservation units, basic material, genetic trials)( <b>D4</b> )	WG1; 2; 3
List of most endangered/diverse species and populations and those key for the future of the EU forest sector under global change ( <b>D8</b> )	2; 3; 1
Identification of most relevant species ( <b>D8.1</b> )	2; 1; 3; 4

<b>Partially achieved</b>	
Maps, atlas, databases ( <b>D1</b> )...Inventory of regional/ national maps and/or links to web sites of climatic maps including future scenarios, reduce a climate scenarios map, location of soil types and morphology, pedo-climatic parameters characterizing species ranges	WG1
A web-based directory of human resources and infrastructure/organizations working or skilled on FGR of MaP populations ( <b>D2</b> )	1; 2; 3
Maps of the present variation of the main genetic parameters related to erosion - extinction risks by species/populations ( <b>D5</b> )	2; 1
Predictive maps of changes in the distribution, composition and structure of some selected species in relation to climate change scenarios ( <b>D6</b> )	2; 1
Guidelines for mainstreaming genetic diversity into sustainable forest management in the context of global change in Europe (including legal transfer issues) ( <b>D9</b> )	3?
Conferences, workshops, training schools, open access databases, web toolbox, reports, publications, STSMs ( <b>D10</b> )	4

<b>Not achieved</b>	
A directory of genetic resource conservation methods applied in COST and neighbouring countries, with special reference to global change ( <b>D3</b> )	WG1; 2
Report on scientific and technical information on the potential effects of climate change on FGR including analysis of existing comparative genetic trials ( <b>D7</b> )	2

- **Progress report of working groups**

See Annexes

## **9. Scientific planning**

### **a. Scientific strategy**

The Scientific activity has been carried out in Bucharest in two phases:

#### **Plenary (MC and WGs)**

During the preliminary Plenary meeting the Chair and Vice-Chair reported the activities of the year as well as the results after the mid-term evaluation (as indicated in the above tables). Considering the comments of the Evaluator and the objectives of the Action it was requested to WGs to produce the following results that fit with the deliverables.

- All WGs should establish deadlines for preparation, analysis and dissemination of all results obtained so far according to deliverables
- WGs were also requested to establish sub groups within WGs to focus on special topics and prepare common scientific publications:
  - ✓ Two task forces per WG (4 facilitators per task force)
  - ✓ Names of all real contributors to be inserted as Authors
  - ✓ Minimum 2 papers per WG should be prepared
  - ✓ For each paper a facilitator and task force should be assigned and added to the following table:

<b>WG #</b>	<b>Title</b>	<b>Journal</b>	<b>Task force names</b>	<b>List of voluntary contributors to be involved</b>	<b>Estimated submission date</b>

- WG1 Should:
  - ✓ Clarify the GENFORED database situation
  - ✓ Finalise the distribution maps
- WG2 and WG3 should:
  - ✓ Compare the species distribution maps with the results of the project "*Maximize the production of goods and services of Mediterranean forest ecosystems in the context of global changes*" (funded by FGEF).
  - ✓ Finalise the databases assigned
- WG4 should:
  - ✓ Improve interaction and dissemination to stakeholders
  - ✓ Plan how and where disseminating the policy brief
  - ✓ Past STSMs – add a cover page with all basic information (currently lacking) and a template for future reports.
  - ✓ Promote joint meetings
  - ✓ Organise Training schools in 2016
- **MC meeting**, where even if the *Quorum* was not met, the main issues of Plenary, WG and follow up meetings were discussed.

**WG1 (as per email of the WG1 leader sent on October 6, 2015. WG1 leader wasn't at the meeting)**

- Production of a scientific report from INIA team and the feedback and collaboration of interested people from WG1 and other groups
- Production of operative GIS maps
- Preparation of paper presenting methods and results of WG1 work for end 2015/start 2016
- GENFORED – would be a valuable dissemination tool and would be linked to the development of the web page – however if it will not increase the flow of data into the database it is not useful, another way of sharing data?
- If coordinates are provided – are WG1 able to establish whether the population is marginal?

**TO DO**

**Approval of MC on:**

1. Organisation of WG meeting in early 2016
2. Production of priority maps as designated by WG2 by end of the year
3. GENFORED –estimation needed of costs and to be established what it brings in terms of extra data to database
4. Suggest an STSM enhancing the production of maps?
5. Issue with resolution – data-mining for ecological marginality for populations where e.g. climatic data is missing – is this possible?
6. WG3 database could also be used to decide what type of marginality?

**TO DO**

**Approval of MC on:**

1. Propose a data analysis/paper writing workshop for WG2



2. Draw together results from 5 questions to 2 papers
3. Will need maps from WG1 for the key analysed species
4. Clarification from COST office for weighting given to papers written by select group and acknowledging COST FP1202
5. Key participants who will participate in workshops (before January = data analysis) and 2016 (paper writing) will need to be decided asap
6. What type of adaptive data should be updated to GENFORD?
7. WG2 Leader – WG1:Contact regarding maps
8. need to sort out issues regarding access permission for dataset

### **WG3**

1. Expert database – improved categories to make easier for users (drop down menus rather than free text), ready to circulate soon
2. Current contributors should check existing records to ensure they are correct
3. How to make the database so that it can be seen (and potentially additional information uploaded)
4. Ask steering committee of EUFORGEN whether they can host database (and can link to EUFGIS etc.)
5. Higher outreach by translating policy brief
6. Produce a summary template of opinion paper and translate into multiple languages – publish in national forestry journals etc.
7. Propose a special issue for papers from WG2?
8. Side event at conferences – widely accepted
9. Production of poster of main results – can and reach many different events

### **TO DO**

#### **Approval of MC regarding:**

1. Funds for translation of policy brief into multiple languages (which languages - ask Scientific Office for advice?)
2. Ask steering committee of EUFORGEN whether they can host database (and can link to EUFGIS etc.)
3. Distribute updated database
4. Finalisation and submission of opinion paper
5. Updated email list of all participants so that database (and other disseminating info) is sent to all interested people
6. Produce summary opinion paper template for translation
7. Production of a poster for dissemination at multiple events (e.g. COFO)

### **WG4**

1. Need details on photo-gallery – coordinates and few lines of description – will previous contributions be contacted?
2. Pictures of meetings would be welcome
3. Newsletter issue II
4. Launch 2015 III call in next few days – please advertise call
5. Training school – IV in January 2016 (still part of 2015 period)
6. Dissemination activities – COP21; IUFRO; COFO; Special issue of final conference
7. How to attract people to a restricted topic such as MaP?
8. Which journal could be used for a special issue?

### **TO DO**

#### **MC approval needed on:**

1. 2016 Training school in Balkan country (Serbia, Romania?)

2. Final conference of action in Arezzo Sep/Oct 2016 – 1 (or 2) day FP1202 meeting; 1 day field trip; 2 day international conference
3. Request for support to meeting where purpose is to disseminate results: < €500 conference fee + travel/accommodation/subsistence
4. STSM call early 2016 (only one call in final year)
5. Submit proposals for conferences
6. Suggestions of delegates for final conference invitation and for invited speakers
7. Suggestions for Journal which would be suitable/amenable to a special issue?
8. Photos of meetings and MaP populations (detail including coordinates, few lines of description)

- **Action Budget Planning**

No idea at present about the 2016 WPB.

Estimated activities for end of 2015 and next IVWBP:

WBP	Activity	Estimated Cost per person	LOS	Total estimated cost	When	#	Days	Location
III	WG1 - workshop [what is intended?]	800	400	8400	Early 2016	10?	2 ?	Madrid
	WG1 + WG2 + WG3 workshop [poss with above workshop?]	800	540	7740	Early 2016	9	3	Madrid
IV	WG2 - paper writing workshop	800	900	12900	April/May 2016	15	3	Firenze
	Training school: title - Monitoring phenotypic variation and data management?	800 trainers 1000 in total per trainee	2000	21000	June 2016	15 + 5 trainers	5	Serbia
	STSM 2016 Call I			15000	2016 Call I Early 2016	10	-	-
	Final Plenary meeting + 1 day field trip + conference (session topics?)	800	5600	61600	Sep/Oct 2016	60 + 4 invited	1 + 1 + 2	Arezzo
	Attendance of meetings to disseminate results	800	500 (conference fees)	2600	-	2	-	-
	Open access publications			4000	2016	3	-	-
	Attendance at COFO for MaP FGR side event - 1 representative/WG + FD	800	400	8400	July 2016	4	2	Rome
	Translation of policy brief			10000				
	Printing costs of translated policy briefs and newsletter			3000				
	Website maintenance			1000				
Newsletter			2000					

**\*\*Note of the Chair/Grant Holder:**

Please consider the amount forecasted for the translation, lay out and editing of the Policy Brief.

How many languages?

Which criteria to promote one language respect to others?

We can't translate into 36 languages.

Could we use this money for workshops and working seminars?

- **Long-term planning (including anticipated locations and dates of future activities)**

**Urgent need**

- to organize WG meetings by end of the year and beginning of 2016
- Next TS to be organized in Denmark in January 2016

- Last 2016 training school to be organized in Serbia or Romania
- Final conference of the Action to be organized in Sept/Oct 2016 in Arezzo (Italy)
- Next call for 2016 STSM to be launched in early 2016 as soon as the budget allocation is approved.

- **Dissemination planning (Publications and outreach activities)**

WG3 will submit the opinion paper by December 2015

WG1 will produce a paper on its results in early 2016

WG4 will produce the II Newsletter and keep updating the website of the Action following suggestions of Cost Action FP1202 members

Scientific articles will be promoted at the end of STSMs

## **10. Requests for new members**

## **11. Non-COST applications to the Actions**

Montenegro results still pending.

## **12. AOB**

## **13. Location and date of next meeting**

The Final Plenary meeting will be held in Arezzo (Italy) in September/October 2015

Precise dates for WG meetings will be established as soon as possible.

## **14. Summary of MC decisions**

- WG1 will organize a WG meeting in early 2016;
- The current approach for producing maps of climatic marginal forest tree populations in Europe promoted by WG1 is approved;
- WG1 will provide an estimation of maintenance cost of the GENFORED database used for data collection by WG1;
- WG2 will produce two scientific articles in 2016;
- Funds for translation of the policy brief into more languages should be allocated;
- WG3 will finalize the opinion paper by end of 2015;
- WG3 will produce a poster for dissemination at multiple events;
- WG3 leader will get in touch with EUFORGEN to propose them to host the WG3 database produced;
- Next training school will be hosted by Romania or Serbia;
- Final conference of the Action will be hosted in Arezzo (Italy) on September/October 2016
- 2016 call for STSM will be launched as soon as possible and it will kept open for the whole last year

## **15. Closing**

The meeting closed at 18H00.

## WP1. 2015 Annual progress report

### Objective:

During this period we have performed the analysis of marginal populations in different species:

- *Pinus halepensis* Mill.
- *Pinus pinaster* Ait.
- *Pinus nigra* Arnold.
- *Pinus pinea* L.
- *Pinus sylvestris* L.
- *Abies alba* Mill.

according to the suggestions by the MC in the Florence meeting.

The work completed include the analysis of the ecological climatic niche of each species, and the identification of the 5% and 10% populations in the margin of this climatic ecological niche based on the EUFORGEN distribution maps (to separate plantations from the other areas).

### Approach followed

#### Target species, study area and occurrence records

The study area includes northern Africa and most of the European continent covering all the territories inhabited by the target species but for *P. sylvestris* distribution as the northernmost populations of this species (most of Norwegian, Swedish and Russian distribution) were not included.

Although, in general, it is recommended to comprise the species entire distribution range when modeling its environmental niche, using just part of it depending on the pursued objective, has also been largely seen in literature (e.g. Guisan *et al.*, 2007). In this work we focused on Mediterranean pines and thus the selection of the study area should be done considering mainly these species characteristics (see Barve *et al.*, 2011) as the use of a too large study area has been contraindicated (Giovanelli *et al.*, 2010).

For the selection of the occurrence records, we applied the same methodology described in Serra-Varela *et al.* (2015) for all the species included in the study. We combined the Tree Species Distribution for Europe (TSDE; Köble & Seufert, 2001) from the Joint Research Center's AFOLU data portal (<ftp://mars.jrc.ec.europa.eu/Afoludata/Public/DS66/>) and the EUFORGEN database from the European forest genetic resources programme ([http://www.euforgen.org/distribution\\_maps.html](http://www.euforgen.org/distribution_maps.html)).

TSDE maps tree species occupancy percentage in Europe at a 1 km grid, but it does not differentiate native and planted populations. EUFORGEN delivers a distribution shape that, while spatially less accurate, includes the whole species range within Europe and Northern Africa, and specifically excludes planted populations.

Therefore, by filtering TSDE occurrences with EUFORGEN we obtained a good approximation of species' native range (obtained distributions are shown in Fig. 1 – Fig. 6). Possible pseudo-absences corresponded to all the rest of the territory within the study area where TSDE reported 0 % occupancy.

The numbers of presences amounted to: 135,822 (*P. halepensis*), 128,838 (*P. pinaster*), 111,605 (*P. nigra*), 140,504 (*P. pinea*), 2,823,259 (*P. sylvestris*) and 814,447 (*A. alba*). The number of pseudo-absences is specified below together with algorithm selection.

### Bioclimatic data

We downloaded the 19 bioclimatic variables available in WORLDCLIM (Hijmans *et al.*, 2005) representative of the period 1950-2000 for the analysis.

In order to avoid multicollinearity effects, we retained variables with Pearson correlations lower than 0.75 as the use simple methods based on rules of thumb have proved to be as effective as more complicated methods (Dormann *et al.*, 2013). This threshold value is a bit less restrictive than the common value of 0.70 but more flexible thresholds have also

been used in literature (see Elith *et al.*, 2006 for an example). Among highly correlated variables we kept the one with highest explained deviance scores (D2) when individually fitted in a Generalized Linear Model (GLM; McCullagh & Nelder, 1989).

We performed this analysis individually for each species and selected two temperature and two precipitation related variables to characterize their bioclimatic niche. For all the species, we automatically discarded BIO8 and BIO9 as the steep gradient shown by these variables, in which very often two adjacent cells are characterized by extremely different values within the study area for no obvious reason, may lead to artifacts in the SDM output maps. Finally we performed a Variance Inflation Factor (VIF) test and adjusted variable selection to ensure that all VIF values were below a threshold value of 10.

The similar patterns detected in D2 values in *P. pinaster* / *P. halepensis* and *P. pinea* / *P. nigra* enabled the selection of the same set of variables for each pair of species while *P. sylvestris* and *A. alba* had an independent bioclimatic variable set.

Despite the very low D2 scores reached when individually fitting GLMs to precipitation related variables in the case of *P. nigra*, it was necessary to include them among its bioclimatic predictors. The final set of relevant weakly correlated variables for each species is shown in Table 1.

### Species Distribution Models

To model the distribution of species, we selected Generalized Additive Models (GAM; Hastie & Tibshirani, 1986) processed in BIOMOD (Thuiller *et al.*, 2009) using the package "biomod2" (default settings for the model) in the R statistical software environment (R Development Core Team, 2013). We randomly selected a large number of pseudoabsences (five times the number of presences except for *P. sylvestris* as there were not enough cells within the study area to reach the required amount) and same weight was given to presences and absences as recommended for GAM by Barbet-Massin *et al.*, (2012). Model performance was assessed by means of True Skill Statistic (TSS; Allouche *et al.*, 2006) and Area Under the ROC Curve (AUC; Fielding & Bell, 1997).

The large number of occurrence records available permitted a random division of each dataset into two equally-sized subsets for training and evaluating. Both subsets maintained the initial proportion between presence and pseudo-absence records. Probabilistic model outputs based on current climatic conditions were converted to binary maps (environmentally suitable vs. environmentally unsuitable) by defining thresholds that optimized TSS values.

#### *Marginal populations*

We considered marginality in an environmental framework i.e. marginal populations are those inhabiting rare or extreme environmental conditions within the current distribution of the species. Thus, we defined as marginal populations those that obtained a predicted probability of environmental suitability below the fifth and tenth percentile of the distribution of the species.

## Results

### Species Distribution Models

The models obtained moderate to high performance as was revealed by AUC and TSS scores (see Table 2). AUC scores are very high (almost above 0.95 for all species) while TSS values showed a wider range of values (from 0.754 in *P. nigra* to 0.876 in *P. pinea*). Sensitivity and specificity scores were also elevated although sensitivity displayed higher values than specificity in all cases. Thereby, models were better able to adequately identify presences than absences.

Probabilistic and binary geographic projections for all species are shown in Fig. 1 - Fig. 6.

In the purely Mediterranean species i.e. *P. halepensis*, *P. pinaster*, *P. nigra*, *P. pinea*, the predicted projections (both probabilistic and binary) widely extended

beyond the currently occupied territory of the species (Fig. 1 – Fig. 4). This result suggests that there are additional reasons further than climate limiting these species distributions (e.g. dispersal limitation, anthropogenic disturbances or pests and diseases). Specifically in *P. nigra* we already found some evidence of this as the D2 explained by all precipitation related variables was very low (below 10% in all cases; see Methods section). Other algorithms not as flexible as GAM, such as Random Forest (RF - Breiman, 2001) or Boosted Regression Trees (BRT - Elith et al., 2008) or the use of several algorithms in an ensemble model, would obtain projections that would fit better the current distribution of the target species.

Nevertheless, these algorithms obtain very high probability of environmental suitability in all presence records thus hindering the detection of environmentally marginal populations with the current strategy applied. On the contrary, the predicted projections for *A. alba* and *P. sylvestris* were very similar to the realized niche (i.e. current distribution) suggesting that, in this case, bioclimatic variables play a major role in driving these species' distribution.

### **Marginal populations**

Marginal populations detected for each species can be checked in Fig. 1 – Fig. 6. The values for the 5th and 10th probability threshold percentiles used to define environmental marginality are shown in Table 3.

### **References**

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## Tables and Figures

Table 1: Set of relevant and weakly correlated bioclimatic predictors selected for each target species

Species	Temperature predictor 1	Temperature predictor 2	Precipitation predictor 1	Precipitation predictor 2
<i>Pinus halepensis</i> <i>Pinus pinaster</i>	BIO4 (Temperature Seasonality)	BIO11 (Mean Temperature of Coldest Quarter)	BIO12 (Annual Precipitation)	BIO18 (Precipitation of Warmest Quarter)
<i>Pinus nigra</i>	BIO4 (Temperature	BIO11 (Mean Temperature of	BIO18 (Precipitation	BIO19 (Precipitation



<i>Pinus pinea</i>	Seasonality)	Coldest Quarter)	of Warmest Quarter)	of Coldest Quarter)
<i>Pinus sylvestris</i>	BIO4 (Temperature Seasonality)	BIO6 (Min Temperature of Coldest Month)	BIO16 (Precipitation of Wettest Quarter)	BIO18 (Precipitation of Warmest Quarter)
<i>Abies alba</i>	BIO7 (Temperature Annual Range)	BIO11 (Mean Temperature of Coldest Quarter)	BIO15 (Precipitation Seasonality)	BIO18 (Precipitation of Warmest Quarter)

Table 2: Area Under the ROC Curve (AUC) and True Skill Statistic (TSS) scores from the Species Distribution Models fitted for the different species. Cutoff values (optimizing TSS) to convert probabilistic projections into binary models are also included as well as its associated Sensitivity and Specificity.

Species	AUC	TSS	Cutoff value (optimizing TSS)	Sensitivity (optimizing TSS)	Specificity (optimizing TSS)
<i>P. halepensis</i>	0.948	0.816	453.0	97.093	84.481
<i>P. pinaster</i>	0.967	0.843	525.0	96.408	87.895
<i>P. nigra</i>	0.947	0.754	551.0	91.644	83.745
<i>P. pinea</i>	0.967	0.876	565.0	97.109	90.510
<i>P. sylvestris</i>	0.966	0.857	677.0	92.963	92.696
<i>A. alba</i>	0.970	0.833	586.0	91.927	91.347

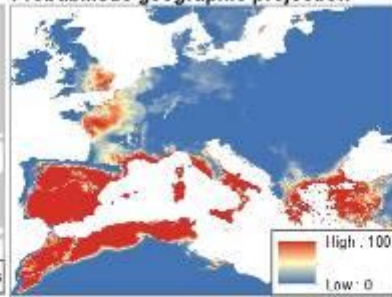
Table 3: Fifth and tenth percentiles values used as thresholds to define marginal populations

Species	5 <sup>th</sup> percentile	10 <sup>th</sup> percentile
<i>P. halepensis</i>	56.0	69.9
<i>P. pinaster</i>	58.3	71.2
<i>P. nigra</i>	44.1	57.9
<i>P. pinea</i>	66.4	76.2
<i>P. sylvestris</i>	57.9	73.9
<i>A. alba</i>	40.5	64.2

Current distribution range



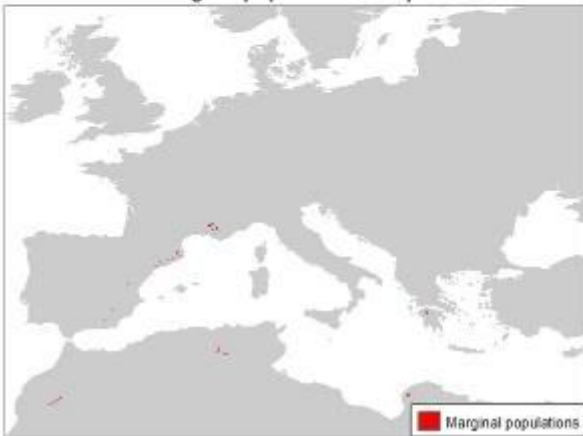
Probabilistic geographic projection



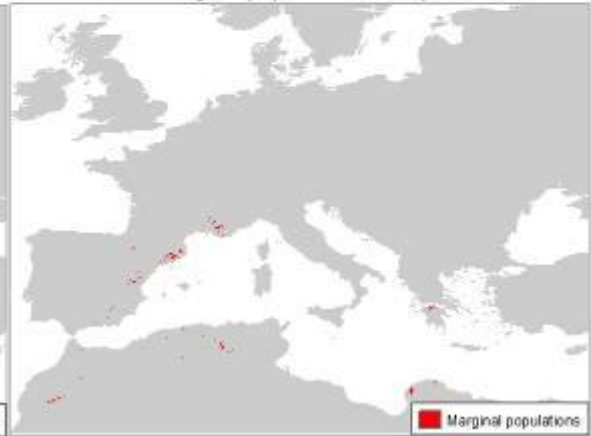
Binary geographic projection



Environmental Marginal populations: 5th percentile



Environmental Marginal populations: 10th percentile



## WG 2 – Annual progress report (Oct. 2014 - Sept. 2015)

G.G. Vendramin and P.G. Alizoti

The FP 1202 WG2 is populated by the following 44 country representatives. The WG is coordinated by G.G. Vendramin (Leader) and P.G. Alizoti (Deputy Leader)

1	Leonardo Galo	Argentina	23	Koen Kramer	Netherlands
2	Berthold Heinze	Austria	24	Tore Skroppa	Norway
3	Dalibor Ballian	Bosnia & Herzgovina	25	Igor Yakovlev	Norway
4	Ivaylo Tsxetkov	Bulgaria	26	Justyna Nowakowska	Poland
5	Nicolas-George Eliades	Cyprus	27	Malgorzata Sulkowska	Poland
6	Josef Frydl	Czech Republic	28	Piotr Markiewicz	Poland
7	Ole K. Hansen	Denmark	29	Anna Hebda	Poland
8	Leena Yrjänä	Finland	30	Carolina Varela	Portugal
9	Bruno Fady	France	31	Jorge Paiva	Portugal
10	Mirko Liesebach	Germany	32	Susana Araújo	Portugal
11	Monika Konnert	Germany	33	Alexandru Lucian Curtu	Romania
12	Paraskevi (Evi) Alizoti	Greece	34	Sasa Orlovic	Serbia
13	Colin Kelleher	Ireland	35	Dusan Gomory	Slovakia
14	Giovanni G. Vendramin	Italy	36	Roman Longauer	Slovakia
15	Francesca Bagnoli	Italy	37	Gregor Bozic	Slovenia
16	Maria Emilia Malvoti	Italy	38	Marjana Westergren	Slovenia
17	Maria Emilia Malvoti	Italy	39	Eduardo Notivol	Spain
18	Fulvio Ducci	Italy	40	Andrea R. Pluess	Switzerland
19	Krista Klanberga-Silina	Latvia	41	Caroline Heiri	Switzerland
20	Una Neimane	Latvia	42	Matthias Arend	Switzerland
21	Bouchra Douaihy	Lebanon	43	Joukje Buiteveld	The Netherlands
22	Magda Bou Dagher	Lebanon	44	Stephen Cavers	UK

### GENERAL AIMS OF WG 2

- Evaluation and analysis of WG1 information (e.g. genetic diversity maps per species/populations, methodology for evaluation of FGR diversity, compilation of databases of relevant institutions, genetic material, trials and networks, gaps of information).
- Standardization of methods.
- Meta-analysis of the data to identify common and divergent trends of FGR response to global change.

### SCIENTIFIC OBJECTIVES

- Identification of the most relevant species - i.e. species with ample information on adaptive traits and genetic variation evaluated via molecular markers with an extensive distribution and marginal populations at the leading and rear edge, as well as populations growing in marginal ecological conditions, considering the optimum range of conditions for each species.
- Survey on the existing information on variability of relevant genetic parameters by species for molecular markers and adaptive traits.

- Identification of gaps on information and knowledge on species, areas of distribution and tools, for conservation, use of MaP FGR in COST and neighbouring countries.

## **ACTIVITIES IN RELATION TO THE FP 1202 DELIVERABLES AND MILESTONES DELIVERABLES AND MILESTONES:**

-DELIVERABLE 5: Maps indicating the extend of genetic variation recorded for populations of the species under investigation (target species) based on molecular markers and genetic parameters evaluated by adaptive/growth and life-history traits. Identification of genetic parameters related to genetic erosion and extinction risks by species and population.

- Maps were constructed for the species of interest on a population level with regards to their conservation status and their marginality (distribution, ecology, altitudinal).
- Data on neutral markers were collected from a number of participants for the species of interest and their joint analysis is in progress.
- Poor input of data was recorded for adaptive traits despite the effort of the WG leaders and the distributed data sharing agreement on which all participants agreed unanimously during the Sesimbra meeting. Given the problems experienced in the use of the Genford Database, despite the two training sessions organized by WG2 and its accessibility by the WG 2 Leaders, it will be proposed to the participants to send the raw data directly to the WG leaders in case they accepted the Data sharing agreement, so that the Deliverable 7 below can be delivered by the end of the project. In any other case this goal will be very hard to achieve.

-DELIVERABLE 6 : Predictive maps of changes in the distribution, composition and structure of some selected species in relation to climate change scenarios

-MILESTONE 2: "Selection of relevant species and MaP populations"

Based on the metadatabase the following species were selected as relevant for studying the composition and spatial structure of adaptive genetic variation: *Fagus sylvatica*, *Abies sp.*, *Picea abies*, *Pinus halepensis/brutia*, *Pinus pinea*, *Pinus nigra*  
For studying the spatial structure of genetic variation based on neutral genetic markers the following species were recognized as relevant: *Fagus sylvatica*, *Fraxinus excelsior*, *Picea abies*, *Abies sp.*, *Quercus robur*, *Pinus nigra*, *Pinus halepensis/brutia*, *Quercus petraea*

### **EXPECTED IN COLLABORATION WITH WG1**

In Progress: The above Deliverable needs to be delivered in collaboration with WG1 that will provide ecological, topographic, climatic information and GIS maps. The information above is expected by WG1 as soon as it concludes its work.

-DELIVERABLE 7: Report on scientific and technical information on the potential effects of climate change on FGR including analysis of comparative genetic trials  
Deadline : Expected by the end of the project

IN PROGRESS

*Warning:* The deliverable will be hard to deliver in case there is no further input of raw data from comparative genetic trials established for the species of interest as mentioned above. As access and use of the Genford databased has been proved to be problematic up to now, it can be proposed to the participants who signed the data sharing agreement to send their files directly to the WG Leaders, who are responsible

to use the data only for the scopes of the project and for the completion of the WG2 Case studies.

**-DELIVERABLE 8:** List of most endangered species and populations and those key for the future of the EU forest sector under global change

Deadline: Expected by the end of the project

IN PROGRESS AND IN COLLABORATION WITH WG1

*Warning:* This deliverable depends also on the inputs of raw data on neutral markers and data on the adaptive variation as studied in comparative field trials for the relevant species, which is poor up to now.

In case the input of raw data improves, the endangered MaP populations of the relevant species, lying at the limits of the species distributions could be identified based on the genetic variation maps in conjunction with ecological, climatic, topographic, soil maps and modeling based on climate change scenarios that will be delivered by WG1.

#### **-OTHER ACTIVITIES:**

-Teaching in the summer school organized in PIEVE TESINO (ITALY)

- Contribution to the STSMs

- Contribution to the preparation of the opinion paper (coordinated by WG3 and in collaboration with all other WGs of the Action.

#### **REPORT OF PROBLEMS**

-Problems with the use of Genford Database and the upload of data from the participants, who could be discouraged.

-Lack of access of the WG Leaders to the few files of raw data inserted so far in the Genford DB, so that they can evaluate the inputs in terms of experiments and populations included.

-Collaboration among Working Groups could be more efficient. There is a strong need for better transfer of information among those WGs that need to collaborate to reach certain goals.

-Coordination efforts should intensify throughout the year to improve efficiency and collaboration among WGs.

## **WP3 Annual progress report**

WG3 chair and co-chair:

Bruno Fady (Management Committee member, France) and  
Philippos Aravanopoulos (Management Committee member, Greece)

### **1. General aims of WG3 in the Cost Action.**

WG3 of COST action MaP/FGR is devoted to "Mainstreaming genetic diversity into sustainable forest management in the context of global change, considering both conservation and use of FGR". WG3 has one main deliverable in the COST action: "Guidelines for mainstreaming genetic diversity into sustainable forest management in the context of global change in Europe (including legal transfer issues) (D9)".

Deliverable D9 targets policy makers and managers of forests, but also stakeholders outside this domain, including scientists (geneticists, ecologists, conservation biologists) and protected habitat and landscape managers.

### **2. Specific aims of WG3 for this reporting period**

The specific aim of WG3 during the third year (2015) of the COST action was to circulate and edit a compiled version of an opinion paper on the major challenges faced by MaP populations under global change and their significance and value for adapting forests to global change. This paper is intended to fulfill deliverable D9 in part because it specifically addresses marginal and peripheral populations in Europe and the Mediterranean, their value and how to conserve them and manage and sustainably use them.

This paper is intended as a publication in an international scientific journal and will be a major achievement of the COST action for raising awareness of the importance of marginal and peripheral populations, as it stems from the contribution of a great number of partners from many countries with different concerns for marginal and peripheral populations. The topics of this opinion paper were discussed extensively during the previous management committee meetings of the COST Action and during a specific joint WG2 and WG3 workshop organized in Aix-en-Provence in December 2013.

The other specific aim of WG3 during this reporting period was to compile an expert-based database of marginal and peripheral populations in Europe and neighbor countries. This is intended at providing additional information on the location of marginal and peripheral forests in Europe and neighbor countries, in addition to the statistical approaches used in WG1 (geographic information system and climate based approach) and WG2 (analysis of marker and adaptive trait data). It is also a way to raise awareness of stakeholders of the importance and diversity of marginal and peripheral populations and an invitation for them to consider them in sustainable forest management.

The last specific aim of WG3 during this reporting period was to provide input into the selection of courses for the summer schools and candidates for short term scientific missions, as a way to mainstream the need to consider genetic resources when managing (conservation and use) marginal and peripheral populations.

### 3. List of partners involved in WG3

Table 1. List of experts who expressed their interest in WG3, participated in one of the parallel sessions of COST action FP1202 devoted to the opinion paper or contributed to the opinion paper.

Country	Name	Organization	Expertise	E-mail
Algeria	Mohamed Bouyaïche	Institut National de Recherche Forestière, Alger	Reforestation / biotechnology	mbouyaiche@hotmail.com
Bosnia and Herzegovina	Branislav Cvjetkovic	Faculty of Forestry, Banja Luca	In situ ex situ conservation	cvjetkovicb@gmail.com
Bulgaria	Georgi Hinkov	Forest Research Institute, Sophia	Quercus robur genetics and breeding	georgihi@abv.bg
Bulgaria	Ivaylo Tsvetkov	Forest Research Institute, Sophia	Forestry	tsvet_i@yahoo.com
Bulgaria	Tzvetan Zlatanov	Forest Research Institute, Sophia	Forest inventory	tmzlatanov@gmail.com
Croatia	Sanja Peric	Croatian Forest Research Institute, Jastrebarsko	Forestry	sanjap@sumins.hr
Croatia	Martina Tijardovic	Croatian Forest Research Institute, Jastrebarsko	Forestry	
Finland	Matti Rousi			matti.rous@metla.fi
France	Bruno Fady *	INRA, Avignon	Forest ecology and genetics	bruno.fady@avignon.inra.fr
France	Brigitte Musch	ONF, Orléans	Conservation and management of forest genetic resources	brigitte.musch@onf.fr
France	Eric Collin	Irstea, Nogent sur Vernisson	Conservation of forest genetic resources	eric.collin@irstea.fr
France	Alexis Ducouso	INRA, Bordeaux	Forest ecology and genetics	Alexis.Ducouso@pierroton.inra.fr
Germany	Georg Von Wühlisch *	Thünen Institute, Hamburg	Forest genetics	georg.wuehlisch@vti.bund.de
Germany	Gerhard Huber	Bavarian Office for forest seeding and planting	Provenance tests management	Gerhard.huber@asp.bayern.de
Greece	Philippos Aravanopoulos *	University of Thessaloniki	Forest genetics, conservation and tree breeding	aravanop@for.auth.gr
Greece	Paraskevi Alizoti *	University of Thessaloniki	Forest genetics, conservation and tree breeding	alizotp@for.auth.gr
Hungary	Ervin Rasztovits	University of Western Hungary, Sopron	Climate modeling	raszto@emk.nyme.hu
Hungary	Csaba Matyas *	University of Western Hungary, Sopron	Forest genetics	cm@emk.nyme.hu

Ireland	Colin T. Kelleher	National Botanic Gardens of Ireland, Dublin	Forest ecology and genetics	
Israel	Rakefet David-Schwartz	Institute of Plant Sciences, Volcani Center, Bet-Dagan	Forest genetics	rakefetd@volcani.agri.gov.il
Italy	Piero Belletti	Torino University	Forest genetics alpine species	Piero.belletti@unito.it
Italy	Fulvio Ducci	CRA, Arezzo	Forest genetics and conservation	fulvio.ducci@entecra.it
Italy	Giovanni Giuseppe Vendramin	CNR Florence	Molecular ecology (woody plants)	giovanni.vendramin@ibbr.cnr.it
Lebanon	Magda Bou Dagher	Faculty of science, Saint Joseph university, Beyrout	Population genetics	magda.boudagher@usj.edu.lb
Morocco	Mustapha Bengueddour	HCEFLCD	Desertification, sustainable management	bengueddourmus@yahoo.fr
Morocco	Hassan Sbay	Forest research institute, Rabat	Tree genetic improvement Pinus	hassansbay@gmail.com
Netherlands	Koen Kramer	University of Wageningen	Forest genetics and ecology modeling	Koen.Kramer@wur.nl
Netherlands	Sven de Vries	University of Wageningen	Conservation of genetic resources and tree breeding	Sven.devries@wur.nl
Norway	Tor Myking	Forest and landscape institute	Population genetics of deciduous trees	tor.myking@skogoglandskap.no
Poland	Szymon Jastrzębowski	Forest Research Institute in Sękocin Stary	Conifer breeding and genetics	s.jastrzebowski@ibles.waw.pl
Poland	Dorota Dobrowolska	Forest Research Institute in Sękocin Stary	Forest tree breeding and conservation	
Poland	Jan Kowalczyk	Forest Research Institute in Sękocin Stary	Forest tree breeding and conservation	j.kowalczyk@ibles.waw.pl
Poland	Izabela Pigan	State Forest	Forest tree breeding and conservation	
Portugal	Maria Carolina Varela	Instituto Nacional de Investigação Agrária e Veterinária,	Adaptive traits in Quercus suber, Pinus pinaster and P. pinea	carolina.varela@iniav.pt
Romania	Ecarerina Nicoleta Chesnoiu	Forest research and management institute, Bucharest	Forest management	cathyches@yahoo.com
Serbia	Srdjan Stojnic			srdjan_stojnic@yahoo.com
Serbia	Andrej Pilipovic	Institute of lowland	Tree breeding	andrejpilipovic@yahoo.com



		forestry and environment, Novi Sad	and ecophysiology	
Slovakia	Laco Paule	University of Svolen	Forest tree breeding and conservation	paule@vsld.tuzvo.sk
Slovenia	Marjana Westergren *	Slovenian Forestry Institute	Forest genetics and conservation	marjana.westergren@gmail.com
Slovenia	Hojka Kraigher	Slovenian Forestry Institute	Forest ecology	hojka.kraigher@gozdis.si
Spain	Ricardo Alia	CIFOR-INIA, Madrid	Forest genetics, conservation and breeding	alia@inia.es
Switzerland	Urs Mühlethaler	Bern University of Applied Sciences BFH	Forest ecosystems and society / knowledge transfer	urs.muehlethaler@bfh.ch
Tunisia	Abdelhamid Khaldi	INRGREF, Tunis	Forest management	khaldi.abdelhamid@iresa.agrinet.tn
UK	Annika Telford	Centre for ecology and hydrology, forest research centre, Edinburgh	Population genetics	annt@ceh.ac.uk

#### 4. Organization of the work of WG3 and main topics and problems met

WG3 was able to work during parallel sessions of management committee meetings in 2013 (Rome and Eger) and 2014 (Sesimbra and Edinburgh), and during a specific workshop organized in 2013 in Aix-en-Provence (France). Further work on the manuscript was carried out by e-mail, both within the coordinating team (the 6 main editors) of the manuscript and for compiling feed-back from COST action participants (mostly WG3 members, see table 1).

The decision to select 6 main editors was reached during the Eger 2013 management committee meeting when it became obvious that managing such a large group of contributors would be a hard task. The six editors are identified by an asterisk in Table 1.

The opinion paper is intended to provide a listing of the guidelines and associated legal issues currently in use or implemented for mainstreaming genetic diversity into sustainable forest management in marginal / peripheral populations. We expect to find many gaps in management and conservation strategies when marginal populations are concerned.

The opinion paper also aims at providing a commonly agreed definition of what marginal / peripheral populations are and what challenges are recognized to be critical for these often under-used and under-protected populations.

Finally, it will be a way for the COST action to highlight the importance of marginal and peripheral populations, and to raise awareness of stakeholders of the need to conserve and use them in a sustainable way.

Writing this opinion paper is a particularly long a challenging task. The 6 editors have had countless e-mail exchanges on the contents and organization of the paper. The submission to a journal was intended early 2015 but had to be postponed due to intense discussions that made it necessary to rewrite and re-organize many parts of

the manuscript. Four versions were created in 2015. Version 6 was made available to the 6 editors January 28, 2015, after collecting feedback from co-authors during the management committee meeting in Edinburgh (October 2014).

Version 7 was circulated to all 6 editors on May 22, 2015. Version 8 was sent to all co-authors July 1st, 2015. Version 9 was compiled September 23, 2015 and sent to the 6 editors.

## **5. Major results of WG3 and information achieved.**

The major result of WG3 during this period is the continuing of the process of the writing of an opinion paper on the role marginal populations can play for the sustainable conservation and use of forest genetic resources in Europe. It is a slow process as the authorship is very large (there are currently 15 actively contributing authors) and the views are very diverse and sometime conflicting, as expected for such a hot topic. We see this as the guarantee of a rich text in the end. The new deadline for submitting the paper is the end of 2015.

The current title of the opinion paper (version 5) is: Can peripheral populations contribute to the adaptation of forests to global change?

The contents of version 5 are the following: after an introduction on the main challenges faced by marginal forest tree populations in Europe, the paper focuses first on the state of art of scientific knowledge concerning the adaptive potential of marginal populations. It then reviews management and legal aspects for silviculture and breeding. Finally, it addresses the conservation of forest genetic resources in these under-used and under-managed populations. The paper concludes on research needs and the necessity to combine conservation and use approaches for the sustainable management of marginal populations in Europe and neighbor countries.

The text provides the opinion of the group of authors to many questions such as: Should MaP populations be included in gene conservation networks? Should MaP populations be conserved ex-situ? Should and can they be used in afforestation? Are habitat conservation actions useful for protecting genetic diversity? Are legal and technical (silviculture) methods used to protect and/or MaP populations appropriate?

Is assisted migration a valid and operational option for adaptive forestry? Which gaps in scientific knowledge exist for MaP populations? How to assess the value of MaP populations and what is the minimum information needed for the description of MaP populations? Can MaP populations play an important role in adaptive forestry? For example, we provide a framework for a decision cascade system intended for helping managing marginal and peripheral forests (see below).

Other major results of WG3 include the compilation of the expert-based database on marginal and peripheral populations in Europe and neighbor countries.

Fields include: name of species, location (precise geographical coordinates and elevation), protection status, type of ownership, type of data available and type of marginality and why it is considered marginal. This last piece of information is very important as it is subjective, based partly on practical knowledge, and will be compared to information derived from unbiased assessments (WG1 and WG2). The database currently contains 250 entries from 12 countries and is growing weekly.

Other results of WG3 include a contribution to the organization of the training sessions organized by WG4 and a participation of some WG3 members as lecturers for some seminars (see [http://map-fgr.entecra.it/wp-content/uploads/2015/06/Call\\_TS2015.pdf](http://map-fgr.entecra.it/wp-content/uploads/2015/06/Call_TS2015.pdf) ). WG3 was also involved in the selection of candidates for short term scientific missions (STSMs). The result of one STSM was

the production of 24 distribution maps of important Mediterranean forest tree species, in collaboration with FAO, which concurs with the aims of WG3.

## **6. Next steps for WG3**

The goal of WG3 in the very short term is to finalize the opinion paper (deliverable D9) and have a version ready for submission to a major international scientific journal by late 2015. The editor's group should have a final meeting to close all outstanding content and format issues before the end of November, 2015.

The expert based database of marginal and peripheral populations will continue growing during the next few months. The empirical knowledge provided by WG3 should make it possible to deliver a list of marginal populations worthy of attention in Europe and neighbor countries by the end of the COST Action. It will contribute substantially to deliverable D9. The database will be put on-line on the Cost action website.

### **WP4 Annual progress report**

Leader: Nicolas Picard (FAO- France)

#### **Policy Brief**

A Policy Brief entitled "Marginal and peripheral forests: a key genetic resource for enhancing the resilience of European forests to global change" was finalized with the help of the members of the COST Action, and was presented at the World Forestry Congress in Durban, South Africa, in September 2015.

This six page document presents the key issues related to marginal and peripheral tree populations and explains their importance for climate adaptation. It includes recommendations for decision-makers. This output contributes to the third, fifth and sixth objectives of the MoU.

#### **Training School (TS)**

A TS on forest genetic resources of marginal populations of forest trees at the altitudinal ranges was organized from 31 August to 4 September 2015 at the Alpine Study Centre, Pieve Tesino, Italy. Fifteen trainees from Montenegro, Italy, Tunisia, Poland, Czech Republic, Lithuania, Denmark, Romania, Latvia and Portugal have attended this TS. Conferences were delivered by eight trainers from the Forestry Research Centre-CREA (Italy), Institute of Biosciences and BioResources (Italy), Istituto di Biologia Agroambientale e Forestale (Italy), Adamello National Park (Italy), university of Florence (Italy), and Institute of Plant sciences, Agricultural Research Organization, Volcani Center (Israel).

#### **Short Term Scientific Missions (STSM)**

Two calls for STSM have been launched in 2015. The first call was launched on 15 May 2015 with a response deadline on 21 June 2015. Eleven applications were received, two of which were not eligible. Five applications were accepted on 8 July 2015 and four were not.

The second call was launched on 10 July 2015 with a response deadline on 19 August 2015. Five applications were received. One was not eligible and the four others were accepted on 10 September 2015. The nine applications accepted across the two calls amount to 20,195 € (59% of the 2015 budget).

#### **Web site**

The web site has been updated.